6.9 / Practice workbook

Integrating Using Substitution

Practice

Problems 1–7 / Show your reasoning

1 Find $\int 3x^2\left(x^3+5\right)^4\,dx$.

2 $\int \cos(4x)\,dx =$

A. $\frac{1}{4}\sin(4x)+C$
B. $4\sin(4x)+C$
C. $-\frac{1}{4}\sin(4x)+C$
D. $\sin(4x)+C$

3 Find $\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx$.

4 $\int_0^{\frac{\pi}{4}} \sec^2 x\,\tan x\,dx =$

A. $\frac{1}{2}$
B. 1
C. $\frac{\pi}{8}$
D. $\frac{\pi^2}{32}$

5 A function f has $f'(x) = \dfrac{x}{\sqrt{x^2+16}}$ and $f(0) = 2$.

(a) Find $\displaystyle\int \frac{x}{\sqrt{x^2+16}}\,dx$.

(b) Find $f(3)$.

6 f is differentiable, and f' is continuous. Selected values of f are in the table.

$\displaystyle\int_0^1 f'(2x+1)\,dx =$

x	0	1	2	3
$f(x)$	5	2	6	10

A. 4

B. 8

C. $-\dfrac{3}{2}$

D. 5

7 Find $\displaystyle\int \frac{\cos x}{1+\sin^2 x}\,dx$.

6.9 / Answer key

Integrating Using Substitution

1 $\frac{(x^3+5)^5}{5} + C$

2 (A)

3 $2e^{\sqrt{x}} + C$

4 (A)

5 (a) $\sqrt{x^2+16} + C$; (b) 3

6 (A)

7 $\arctan(\sin x) + C$